Supplementary Material

1 POSSIBLE ADDITIONS TO IMPROVE THE TOY MODEL

Here is a list of the possible improvements that can be made to the toy model that was suggested by colleagues and reviewers.

- Alter the probability of citations of a particular point in a scientist's trajectory based on distance in the knowledge space of future scientists. Though this is likely to make the citation history of scientists in the toy model more realistic, it is unlikely to change the primary result of this paper.
- Make citation pressure directed towards all the trajectories traversed by previous scientists rather than the center of the knowledge circle. This is likely to change the shape of the regions where scientists concentrate, but the primary result of the paper is likely to remain unaffected.
- Add a repulsive pressure between scientific trajectories that get too close - to mimic the pressure not to publish exactly the same result. This will be a force that pushes scientists away from existing knowledge and will act against the primary result of the paper. This pressure will matter less and less in an n-Dimensional case of the knowledge space cause almost every trajectory will be non-overlapping.
- Include randomly variable step sizes. The narrative is that "pioneers" take great strides and hence get closer to discoveries. It may make the model more realistic, but it is unlikely to affect the main result of the model as citation pressures will apply to all scientists irrespective of the randomization of their step sizes.
- Increasing the size (and thereby reach) of knowledge circles as more and more scientists explore a knowledge circle might mimic the growth of a research field over time with new findings made at the boundaries.

2 PERCEPTIONS OF THE SCIENTIFIC COMMUNITY ON "GENIUS"

Leslie et al. (2015) demonstrate that women are under-represented in fields where the practitioners believe that raw, innate talent is the main requirement for success. Their work conducted an exhaustive survey over many fields to arrive at these intriguing correlations. By inspecting their survey on physicists, we can gather particular views of the physics community on the nature of "genius". Figure S1 shows that, on average, senior scientists agree that becoming a top physics scholar requires an innate gift, talent, or special aptitude that can't be taught or acquired through hard work. In contrast, younger scientists (students and post-doc) are divided on this question. More detail on the distribution of views on this question of early-career scientists is shown in Figure S2, and that of senior scientists is shown in Figure S3. From these, it is clear that about 71% of senior physicists believe that success in physics requires a special aptitude or innate ability that cannot be taught. In comparison, only a lower fraction of 49% young scientists believe the same. This suggests that as Grassmann (2022) pointed out, scientists, in our case - physicists, overwhelmingly tend to think genius is innate and success in the field is determined by such an innate ability. In fact, a larger fraction of senior physicists tends to believe this. The results appear to be similar if we look at the same question posed differently in Figure S4. About 70% of senior physicists and 56% of young physicists disagree that with the right amount of effort and dedication, anyone can be a top scholar of physics.

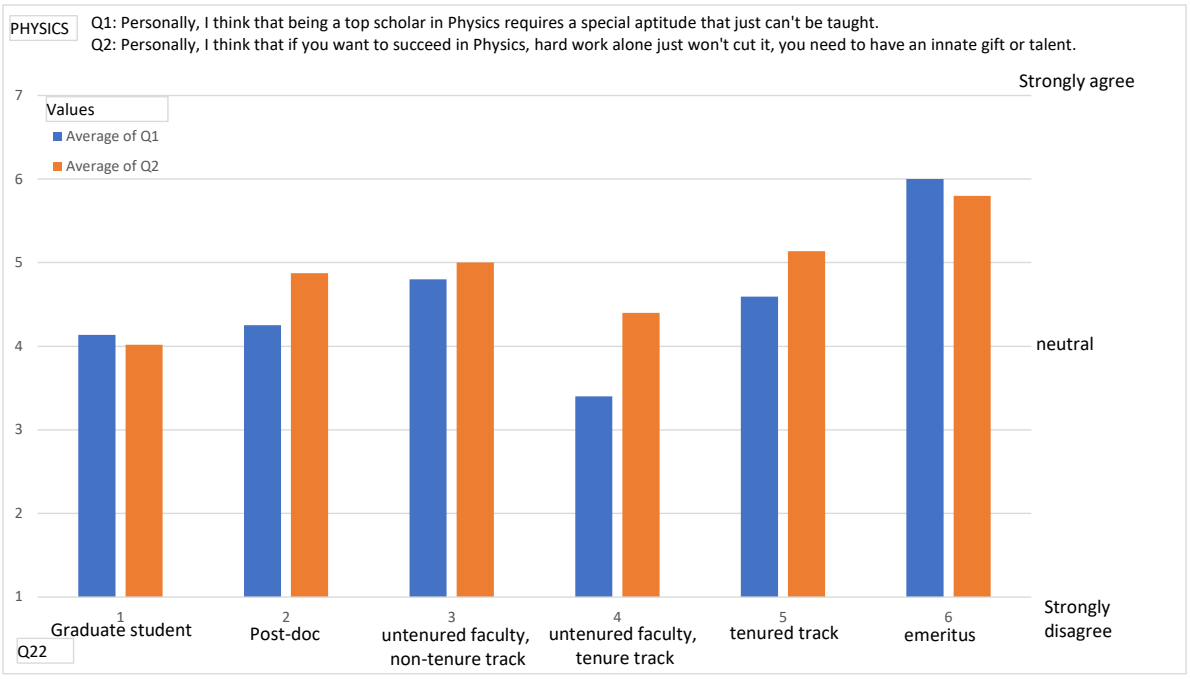

Figure S1. Average agreement of physicists at different career levels with two questions regarding their belief in the innateness of genius. Senior physicists, on average, strongly agree that innate talent is necessary to succeed in physics, while younger physicists are divided on the question. Hence on average, physicists agree that innate talent is necessary to ”succeed” in physics. The data is acquired from the survey data published by Leslie et al. (2015)

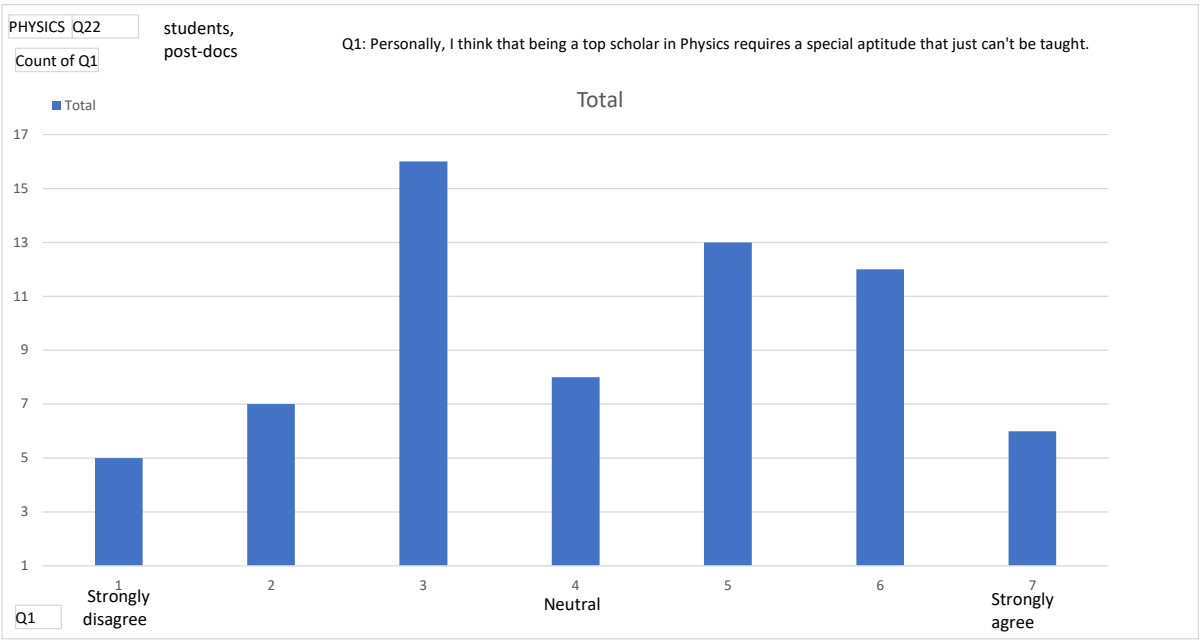

Figure S2. The distribution of views of young physicists on whether being a top scholar in Physics requires a special aptitude that cannot be taught. About 49% of young physicists agree or strongly agree with this view. The data is acquired from the survey data published by Leslie et al. (2015)

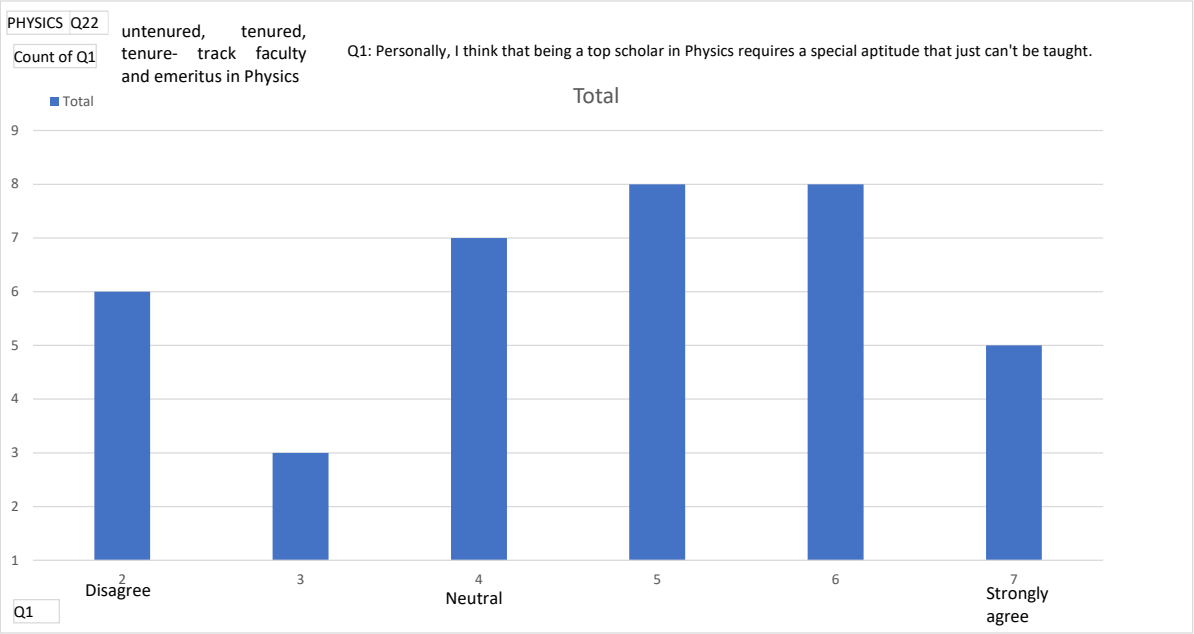

Figure S3. The distribution of views of senior physicists on whether being a top scholar in Physics requires a special aptitude that cannot be taught. About 71% of senior physicists agree or strongly agree with this view. The data is acquired from the survey data published by Leslie et al. (2015)

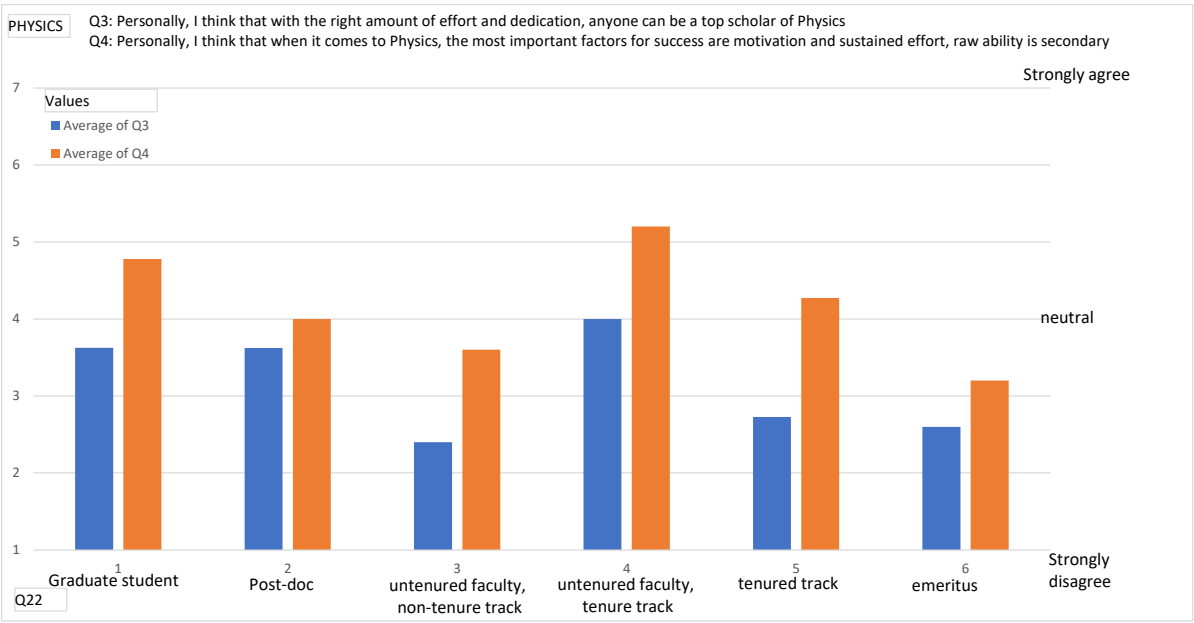

Figure S4. Average agreement of physicists at different career levels with two questions regarding their lack of belief in the innateness of genius. Senior physicists, on average, strongly disagree that effort, dedication, and sustained ability alone can lead to success in physics, while younger physicists remain divided on the question or slightly agree. Hence on average, physicists disagree that hard work and dedication alone can lead to success in physics. The data is acquired from the survey data published by Leslie et al. (2015)

REFERENCES

Leslie SJ, Cimpian A, Meyer M, Freeland E. Expectations of brilliance underlie gender distributions across academic disciplines. *Science* **347** (2015) 262–265. doi:10.1126/SCIENCE.1261375/SUPPL_FILE/1261375.LESLIE.SM.PDF.

Grassmann S. The scientific world is far too obsessed with "genius". *Jacobin* (2022).